

State of California  
AIR RESOURCES BOARD

**PROPOSED AMENDMENTS TO THE  
CALIFORNIA REFORMULATED GASOLINE REGULATIONS**

**Rescission of Wintertime Oxygen Requirement in the Lake Tahoe Air Basin and  
Labeling Requirements for Retail Pumps Dispensing Gasoline Containing MTBE**

Prepared by:

**Planning and Technical Support Division and  
Stationary Source Division**

Contributing Authors

Rich Hackney

Erik White

Jose Gomez

Tom Jennings  
(Office of Legal Affairs)

Reviewed by:

Terry McGuire, Chief, Planning and Technical Support Division  
Debora Popejoy, Manager, Air Quality Data Analysis Section  
Peter D. Venturini, Chief, Stationary Source Division  
Dean C. Simeroth, Chief, Criteria Pollutants Branch  
Gary Yee, Manager, Industrial Section

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**Staff Report: Initial Statement of Reasons  
For Proposed Rulemaking**

Public Hearing to Consider

**PROPOSED AMENDMENTS TO THE  
CALIFORNIA REFORMULATED GASOLINE REGULATIONS**

To be considered by the Air Resources Board on June 24, 1999 at:

Air Resources Board  
Board Hearing Room  
Lower Level  
2020 L Street  
Sacramento, California

Air Resources Board  
P.O. Box 2815  
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## **I.**

### **INTRODUCTION AND SUMMARY**

This report is the Initial Statement of Reasons by the staff of the Air Resources Board (ARB or Board) to support proposed amendments to the Reformulated Gasoline Regulations (Title 13, California Code of Regulations, sections 2260 - 2272) regarding rescission of the wintertime oxygen requirement in the Lake Tahoe Air Basin and requirements for labeling of retail gasoline pumps dispensing gasoline containing methyl tertiary butyl ether (MTBE). The proposed amendments will be considered at a Board hearing on June 24, 1999.

#### **A. Use of Oxygenated Gasoline in California**

During the past two decades, oxygenates have been used to increase the volume and octane of gasoline. More recently, oxygenates have been used as an emission control strategy to reduce carbon monoxide (CO) and, to a lesser extent, hydrocarbon emissions from motor vehicles. In 1990, the amendments to the federal Clean Air Act (CAA) conditionally required states to implement programs in federal CO non-attainment areas to require gasoline to contain a minimum oxygen content in the winter beginning in November 1992. In response to the federal CAA requirements to reduce CO emissions, California established a wintertime oxygenated gasoline program requiring between 1.8 and 2.2 weight percent oxygen content in gasoline.

Also, the CAA directed the U.S. Environmental Protection Agency (U.S. EPA) to adopt federal reformulated gasoline (RFG) regulations applicable starting January 1995 in the nine major metropolitan areas of the country with the worst ozone pollution. The federal CAA required that federal RFG contain at least 2.0 weight percent oxygen year-round. In addition to the federal RFG requirements, California adopted regulations for reformulated gasoline in 1991. Because of the federal requirements for oxygen content in federal RFG, an oxygen content specification was incorporated in the California reformulated gasoline regulations. The California reformulated gasoline program was implemented in March 1996.

California's gasoline regulations do not specify the type of oxygenate required. While there are several oxygenates that can be used to meet the oxygen requirement for gasoline, methyl tertiary butyl ether (MTBE) and ethanol are used most frequently. In 1996, over 95 percent of the gasoline used in California was blended with MTBE.

In California and other parts of the U.S., there have been increased environmental and health concerns about the use of MTBE and other ether-based oxygenates in gasoline. Recent legislation in California (SB 521, The MTBE Public Health and Environmental Protection Act of 1997) directed the University of California to conduct a study of the health and

environmental risks and benefits of MTBE in gasoline compared to other oxygenates. SB 521 also required the Governor to take appropriate action based on the findings of the report and information from public hearings.

In consideration of the report, public testimony, and other relevant information, Governor Davis found that, “on balance, there is significant risk to the environment from using MTBE in gasoline in California.” In response to this finding, on March 25, 1999, the Governor issued Executive Order D-5-99 (Appendix B) which directed, among other things, that California phase out MTBE by December 31, 2002, that the ARB evaluate the necessity for wintertime oxygenated gasoline in the Lake Tahoe Basin, and that the ARB adopt regulations requiring prominent identification at the pump of gasoline containing MTBE. The proposed amendments to the Reformulated Gasoline Regulations in this report are in response to the Governor’s Executive Order.

## **B. Proposed Rescission of Wintertime Oxygen Requirement in the Lake Tahoe Air Basin**

The California Code of Regulations (CCR) Title 13, section 2262.5, currently provides for rescission of the wintertime oxygen requirement in the Lake Tahoe Air Basin after the October 1, 1999 - January 31, 2000 winter period. The ARB staff evaluated the impacts of eliminating the wintertime oxygen requirement in the Lake Tahoe Air Basin prior to this coming winter. The ARB staff relied on a July 1997 research paper, “The Effect of California's Wintertime Oxygenated Fuels Program on Ambient Carbon Monoxide Concentrations” contained in Appendix C and the most recent (1996-1998) ambient CO data from the Lake Tahoe Air Basin. The highest ambient CO concentration observed since 1996 was 5.1 parts per million (ppm) at the Stateline site for an eight-hour average. The State CO air quality standard for an 8-hour average is 6 ppm and is specific to the Lake Tahoe Air Basin while the national CO 8-hour standard is 9.0 ppm.

The cited paper states that the ambient CO concentrations resulting from the implementation of the oxygenated gasoline program showed a 5 to 10 percent reduction in 8-hour CO concentrations due to the addition of oxygenates. Conversely, elimination of the oxygen requirement should be expected to increase 8-hour CO concentrations by no more than 10 percent. Taking the 1996 concentration of 5.1 ppm and adding 10 percent results in a CO concentration of about 5.6 ppm, which is about two-thirds of the national standard, and below the 8-hour state standard. The ARB staff concludes that withdrawal of wintertime oxygen gasoline requirement would not result in CO concentrations that would violate any applicable state or national ambient air quality standards.

The proposed amendment to the California Reformulated Gasoline Regulations would not in itself prohibit the use of MTBE in the Lake Tahoe Air Basin. This proposed action

would no longer require oxygenated gasoline during the winter CO season (October through January) in the Lake Tahoe Air Basin.

**C. Proposed Labeling Requirements for Retail Pumps Dispensing Gasoline Containing MTBE**

Currently, California does not require the labeling of pumps to identify those dispensing oxygenated gasoline. However, there are several pump labeling requirements in the United States specific to oxygenated gasoline. Both the State of Wisconsin and the U.S. EPA have labeling requirements for gasoline pumps dispensing oxygenated gasoline. The National Conference on Weights and Measures has also developed consensus standards for the labeling of pumps dispensing oxygenated gasoline. In addition, the United States Federal Trade Commission (U.S. FTC) has adopted regulations requiring the labeling of the gasoline octane number on retail gasoline pumps. All gasoline pump labeling requirements specify the manner in which the label must be posted on the gasoline pump, the required information on the label, and the appearance of the label.

The ARB staff proposes that the Board adopt new labeling requirements for retail gasoline pumps in California dispensing gasoline containing MTBE in concentrations greater than 0.3 volume percent. The California petroleum pipeline specification for non-oxygenated gasoline is 0.05 weight percent oxygen (0.3 volume percent MTBE) or less. The concentration of MTBE in gasoline can be determined either through direct measurement or record keeping of gasoline deliveries and the number of times the gasoline storage tank has been filled with gasoline containing less than 0.3 volume percent MTBE.

These new labeling requirements are proposed to implement the Governor's Executive Order D-5-99, Item 7, which directs the ARB to develop gasoline pump labeling regulations to allow consumers to make an informed choice on the type of gasoline they purchase. The proposed labeling requirements would require the posting of a label containing the words "Contains MTBE (METHYL TERTIARY BUTYL ETHER)" in a conspicuous location on the gasoline pump and would specify appearance and durability criteria. The proposal would also require anyone delivering gasoline for retail sale to document the presence and amount of MTBE in the gasoline in the bill of lading or other documentation.

Consideration is also being given to requiring on the label the statement, "The State of California has determined that the use of this chemical presents a significant risk to the environment." This would reflect the findings in the Governor's Executive Order.

## **II.**

### **RECOMMENDATION**

The ARB staff recommends that the Board adopt the proposed amendments to section 2262.5, Title 13, California Code of Regulations (Appendix A) which would rescind the wintertime oxygen requirement in the Lake Tahoe Air Basin prior to October 1, 1999, in place of the current sunset date of January 31, 2000.

The ARB staff also recommends that the Board adopt proposed new section 2273, Title 13, California Code of Regulations, which would require the labeling of retail pumps dispensing gasoline containing MTBE.

### III.

## BACKGROUND

This chapter presents background information on the use of oxygenates in gasoline, on the air quality in the Lake Tahoe Air Basin with respect to CO, and on some existing gasoline pump labeling requirements in the United States.

#### A. Oxygenates in Gasoline

Over the past two decades, oxygenates have been used to increase the volume and octane of gasoline. In the late 1970's and 1980's, as lead was removed from gasoline, gasoline producers used small amounts of oxygenates to offset the loss in octane from the removal of lead and to extend the volume of gasoline. More recently, oxygenates have been used as an emission control strategy to reduce CO and, to a lesser extent, hydrocarbon emissions from motor vehicles in response to federal and state regulations.

##### 1. Federal Gasoline Programs

###### *a. Wintertime Oxygenated Gasoline*

The 1990 amendments to the federal CAA added section 211(m), which required states having areas with federally-designated unhealthy levels of CO to establish a program requiring that the wintertime gasoline in those areas contain at least 2.7 weight percent oxygen. The states' oxygenated gasoline regulations were to start November 1992, and were to be submitted to the U.S. EPA as revisions to their State Implementation Plans. The law directed the U.S. EPA to waive the minimum oxygen content requirement, allowing a state to require less of the oxygen additives, if the state shows that fuels with 2.7 weight percent oxygen would interfere with attainment of other air quality standards.

###### *b. Reformulated Gasoline*

The 1990 amendments to the federal CAA also added section 211(k), which directed the U.S. EPA to adopt federal RFG regulations applicable starting January 1995 in the nine major metropolitan areas of the country with the worst ozone pollution. These areas included the greater Los Angeles area and San Diego County. Because the ozone nonattainment status of the Sacramento metropolitan area was redesignated from serious to severe, it became subject to the federal RFG requirements in June 1996. Thus, about 70 percent of all the gasoline sold in California must meet the federal RFG standards. Nationwide, only about 30 percent of the gasoline is subject to the federal RFG requirements.



The federal CAA requires that federal RFG contain no more than one percent benzene, no heavy metals, and at least 2.0 weight percent oxygen year-round. In addition, it further requires a “Phase 1” 15 percent reduction in both volatile organic compounds (VOCs) and toxic emissions in 1995, and an additional 10 percent reduction in 2000 for “Phase 2.”

## 2. California's Gasoline Programs

### *a. The 1992 - 1996 Wintertime Oxygenated Gasoline Regulation*

In response to the federal CAA requirements, California implemented an interim wintertime oxygenated gasoline program to reduce CO emissions during the winter months. California had eight CO nonattainment areas that were required to have oxygenated gasoline. Since about 80 percent of the gasoline used in California was required to be oxygenated, the ARB’s wintertime oxygenated gasoline regulation was implemented statewide.

To avoid significant increases in emissions of nitrogen oxides (NO<sub>x</sub>) from motor vehicles as a result of the wintertime oxygen requirement, the Board adopted a minimum wintertime oxygen limit of 1.8 weight percent and a maximum limit of 2.2 weight percent (Title 13, CCR, section 2258). It was reasoned that this approach would be sufficient to attain compliance with the ambient standard for CO in the coming years while minimizing the extent to which the increased use of oxygen in winter gasoline would interfere with attainment of the ambient standards for particulate matter and ozone. During the period between November 1992 - February 1996, the ARB did not impose a summertime oxygen requirement.

The wintertime oxygenated gasoline regulation has been successful at reducing ambient concentrations of CO in the areas that have experienced exceedances of the federal ambient CO standard. The U.S. EPA recently approved redesignation to attainment for all CO nonattainment areas in California except Los Angeles - South Coast Air Basin (63 Federal Register 15303 (March 31, 1998)). As a result, in August 1998, the Board adopted amendments to the wintertime oxygen requirement, effective September 21, 1998, that eliminated the minimum oxygen content requirement for gasoline sold in the winter in CO attainment areas. However, in order to ensure maintenance of the federal and State ambient CO standards, the wintertime oxygen requirement remains until January 31, 2000, for the Fresno Metropolitan Statistical Area (MSA) and the Lake Tahoe Air Basin. The wintertime oxygen requirement remains unchanged in Los Angeles, Orange, Riverside, San Bernardino, Ventura and Imperial counties.

### *b. Reformulated Gasoline*

In 1991, the ARB adopted comprehensive, reformulated gasoline regulations (Title 13, CCR, sections 2260 - 2272) known as the California Reformulated Gasoline Regulations. The reformulated gasoline regulations establish standards for eight different gasoline properties. Because of the federal RFG and wintertime oxygen requirements, the

ARB established an oxygen content limit between 1.8 and 2.2 weight percent in the reformulated gasoline regulations that applies year-round and statewide. However, outside federal RFG areas, refineries, during the summer, have the flexibility to use more, less, or no oxygenates.

The California fuels standards are designed to achieve maximum reductions in emissions including hydrocarbons, NO<sub>x</sub>, sulfur oxides, potency weighted toxics, and wintertime CO. The reformulated gasoline regulations which were implemented in March 1996, incorporated the interim wintertime oxygenated gasoline requirements.

The California reformulated gasoline regulations allow refiners to vary, through the use of a predictive model, the properties of a gasoline formulation, including oxygen, as long as the model shows that emissions of hydrocarbons, NO<sub>x</sub>, sulfur oxides, and potency-weighted toxics will not exceed the emissions from a complying gasoline blend meeting all of the reformulated gasoline specifications. For federal CO nonattainment areas and severe and extreme ozone nonattainment areas, refiners may still use the predictive model, but they must meet the minimum federal RFG oxygen requirement.

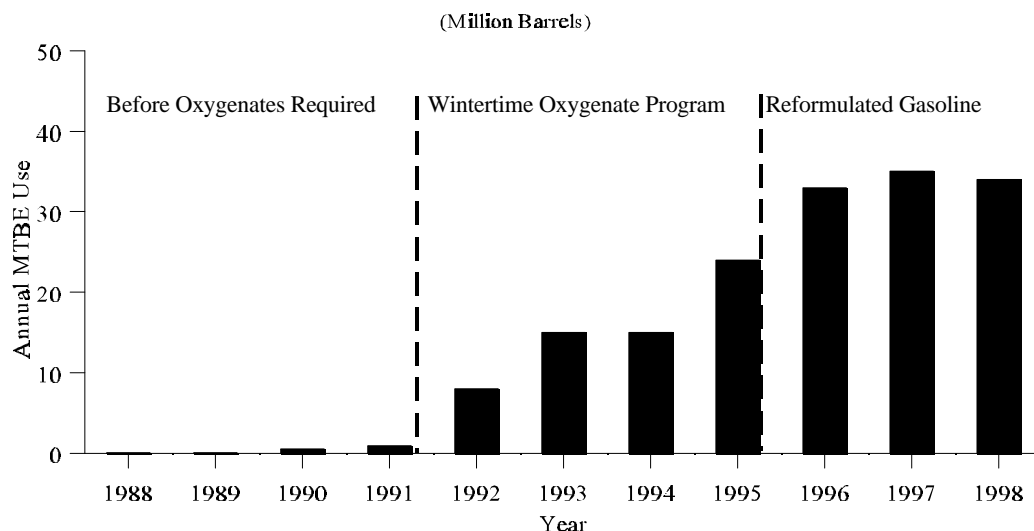
In December 1998, the Board increased the maximum oxygen content limit (oxygen cap) from 2.7 to 3.5 weight percent year-round for gasoline for which the predictive model is used. An oxygen content of 3.5 weight percent is equivalent to an ethanol content of 10 volume percent. However, the change to the oxygen cap will have no impact on the level of MTBE used in gasoline because federal regulations limit MTBE in gasoline to a maximum of 15 volume percent (2.7 weight percent oxygen).

### 3. Oxygenate Use

While there are several oxygenates that California refineries can blend into gasoline to satisfy the regulations requiring oxygen in gasoline, MTBE is used most frequently. Figure 1 shows the annual use of MTBE in California. As can be seen, the use of MTBE has increased significantly since 1992 when oxygenates first became required during the winter under federal law. In 1992, about 25 percent of the gasoline used in California was blended with MTBE. The use of MTBE further increased in 1995 when federal RFG was required in Southern California and in 1996 when California reformulated gasoline was required statewide and federal RFG was required in the greater Sacramento metropolitan area. In 1996, over 95 percent of the gasoline used in California was blended with MTBE, and in 1998, that figure was still greater than 90 percent. Other oxygenates such as ethanol, tertiary amyl methyl ether (TAME) and ethyl tertiary butyl ether (ETBE) are used in much smaller quantities and are generally contained in the remainder of the California gasoline supply. Also, refineries have recently marketed some oxygen-free gasoline in non-federal RFG areas, such as the San Francisco Bay Area.

**Figure 1**

**MTBE Use in California**



**4. Environmental Impacts of MTBE**

In California and other parts of the U.S., there have been increased environmental and health concerns about the use of MTBE and other ether-based oxygenates in gasoline. The U.S. EPA has been actively pursuing these concerns which include questions about MTBE health effects and water contamination. The federal CAA requires the U.S. EPA to evaluate new and previously approved gasoline additives (such as MTBE), taking into account health effects. In response to this, the U.S. EPA requires new and previously approved gasoline additives to be biologically tested for specific health effects, system health effects, and that animal testing be conducted for general and system toxicity, carcinogenicity, mutagenicity, teratogenicity, and reproduction effects. Current research on human exposure to MTBE is expected to be completed during the next four years.

Recent California legislation (SB 521, The MTBE Public Health and Environmental Protection Act of 1997) directed the University of California to conduct a study of the health and environmental risks and benefits of MTBE in gasoline as compared to ETBE, TAME, and ethanol. This comprehensive report on the “Health and Environmental Assessment of Methyl Tertiary Butyl Ether (MTBE)” (UC Report) was presented to the Governor on November 12, 1998.

In response to the UC Report, testimony at public hearings and other relevant information, Governor Davis found:

- MTBE presents a threat to groundwater, surface water, and drinking water.
  - Underground gasoline storage tanks are not leakproof.
  - MTBE is highly soluble in water and transfers to groundwater faster than other constituents in gasoline.
  - MTBE, even in small amounts, renders drinking water unusable.
- MTBE has potential, but not proven, health problems.
- MTBE is not essential to reformulated gasoline.

The Governor issued Executive Order D-5-99 on March 25, 1999, which directs the phase out of MTBE in California by December 31, 2002. The Executive Order also directs, among other elements, that the ARB: assist in obtaining a waiver of the requirements of the CAA for oxygen content in federal RFG, adopt California Phase 3 Reformulated Gasoline regulations, evaluate the necessity for wintertime oxygenated gasoline in the Lake Tahoe Air Basin, adopt regulations requiring prominent identification at the pump of gasoline containing MTBE, and assist in conducting an environmental fate and transport analysis of ethanol.

## **B. Effect of Wintertime Oxygen Requirement in the Lake Tahoe Air Basin**

Since the Lake Tahoe Air Basin was designated attainment in September 1998 for the state CO standard, it would be appropriate to rescind the wintertime oxygen requirement for the area if the CO standard is expected to be maintained. These amendments to the reformulated gasoline regulations would rescind the oxygen requirement for the Lake Tahoe Air Basin, prior to October 1, 1999, instead of the current sunset date of January 31, 2000.

The CO concentrations in the Lake Tahoe Air Basin have continued to decrease with the introduction of wintertime oxygenates in 1992 and the ongoing introduction of cleaner vehicles. The annual maximum 8-hour concentration declined from 9.9 ppm in January 1992 to 7.5 ppm in November 1993, and for each year since then, there has been a steady and significant decrease. The 1996 annual maximum 8-hour concentration of 5.1 ppm represents the “worst case” concentration that is likely to occur. Table 1 shows the CO trends for the CO monitoring sites from 1990 to 1998.

The ARB staff analyzed air quality data before and after the oxygenate program and determined that 8-hour CO concentrations were reduced by 5 to 10 percent due to the fuels program, after adjustments for meteorology using NO<sub>x</sub>/CO ratios as explained in Appendix C. The ARB staff calculated that the removal of the oxygenated fuels may increase CO concentrations no more than 10 percent. In the Lake Tahoe Air Basin the maximum 8-hour concentrations for the last 3 years have been between 3 and 5 ppm. Even with an increase of

10 percent, the air quality would not exceed the applicable State (6 ppm for 8-hour average) or national CO standards (9.0 ppm for 8-hour average).

In addition to the air quality benefits from oxygenated fuels as calculated in the 1998 paper (Appendix C), new car standards for light duty vehicles have also contributed to improvements in air quality. Using MVEI7G1.0C, the latest ARB official Motor Vehicle Emission Inventory Model, ARB staff estimates that there is approximately a 8 percent per year CO emission benefit from old vehicles being replaced with newer models (referred to as “fleet turnover”). Since CO is a directly emitted pollutant, we would expect to see between 4 and 8 percent air quality benefit given the variability of meteorology. Accordingly, it is unlikely that CO air quality would degrade by the full 10 percent due to the removal of oxygenates in gasoline. Rather, the combined impact of removal of oxygenates and fleet turnover will be possibly a 2 to 6 percent increase in CO concentrations.

**Table 1**  
**CO Trends for Lake Tahoe Air Basin**  
**1990 to 1999**  
8-hour Concentrations (ppm)

Site	1990	1991	1992	1993	1994	1995	1996	1997	1998
Stateline*	10.1	9.2	9.9	7.5	7.1	6.3	5.1	3.8	4.3
Sandy Way	N/A	N/A	N/A	3.3	2.6	2.6	2.4	2.4	2.3

N/A = site not operational.

\* Stateline site closed in late 1998; this site represented the localized impacts of the large volume of traffic on Highway 50 near the Nevada border.

### **C. Current and Past Gasoline Labeling Requirements**

There are currently several pump labeling requirements in the United States. These labeling requirements, applicable to specific gasoline properties, specify the manner in which the label must be posted on the pump, the information the label must convey, and the appearance of the label. Several current and past pump labeling requirements for gasoline oxygenate content and octane rating are described below and contained in Appendix E. These requirements are also summarized in Table 2 at the end of this chapter.

## 1. Gasoline Oxygenates

Currently, both the U.S. EPA and the State of Wisconsin have labeling requirements regarding pumps dispensing gasoline containing oxygenates. The National Conference on Weights and Measures also has established oxygenated gasoline labeling standards. Until recently, the California Department of Measurement Standards administered a program requiring the labeling of pumps dispensing gasoline containing alcohol.

### *a. U.S. EPA*

The U.S. EPA has labeling requirements for gasoline programs having a minimum oxygen content requirement. These labeling requirements, contained in Title 40, Code of Federal Regulations (CFR), section 80.35, require each pump that dispenses oxygenated gasoline designed to reduce CO emissions under an oxygenated gasoline program be labeled during the CO control period. The label must state that “The gasoline dispensed from this pump is oxygenated and will reduce carbon monoxide pollution from motor vehicles.” The lettering on the label must be in block letters, no less than 20-point bold type, and must contrast with the label background. The label must be placed on the vertical surface of the pump, on the same side as the price and volumetric meters. In addition, it must be on the upper two-thirds of the pump, clearly visible and conspicuous to the public.

### *b. Wisconsin Department of Commerce*

The Wisconsin Department of Commerce adopted regulations in 1995 requiring the labeling of pumps dispensing either a gasoline-ethanol blend of more than 2 percent by volume ethanol, or federal reformulated gasoline containing any oxygenate (other than ethanol) in amounts greater than 1.5 weight percent oxygen. These regulations are contained in the Wisconsin Administrative Code, Department of Commerce (Chapter Comm 48, Subchapter III, section 48.11). These regulations require that pumps dispensing gasoline-ethanol blends have a label containing the wording “Contains Ethanol” and identifying the volume percent of ethanol in the gasoline. For pumps dispensing federal reformulated gasoline, the label must read “Contains” followed by the name of the oxygenate. The oxygenates that must be identified on the label for federal reformulated gasoline are “Methyl Tertiary Butyl Ether (MTBE)”, “Ethyl Tertiary Butyl Ether (ETBE)”, “Tertiary Amyl Methyl Ether (TAME)”, and “Tertiary Butyl Alcohol (TBA)”.

The regulation requires that the label be placed on the front of the pump, next to the name and grade of the product being dispensed. The label must be in a color contrasting with the color of the pump, with no less than one-half inch high letters, and must be conspicuous to the customer when viewed from the driver’s seat of a motor vehicle 6 feet away from the pump. The label must be able to withstand extremes of weather for one year, and must be resistant to gasoline, oil, grease, solvents, detergents and water.

*c. National Conference on Weights and Measures*

The National Institute of Standards and Technology (NIST) within the U.S. Department of Commerce sponsors the National Conference on Weights and Measures (NCWM). The NCWM develops consensus standards in areas such as measuring device regulations. The NCWM had developed standards for the labeling of pumps dispensing gasoline-oxygenate blends. These standards are contained in NCWM Handbook 130, section 2.20, subsection 2.20.1. This section states that gasoline containing greater than 1 percent by volume oxygenates shall be labeled “with” or “containing” followed by the specific type of oxygenate. The information should be posted on the upper one-half of the gasoline pump, in a conspicuous location from the driver’s seat, in a type not less than one-half inch high.

In addition, to supplement the labeling of pumps dispensing gasoline-oxygenate blends, the NCWM has established standards for identifying the oxygenate on the bill of lading. Handbook 130, section 2.20, subsection 2.20.2 states that documentation must be provided to the gasoline retailer for the purposes of correct labeling of pumps. Specifically, the bill of lading, shipping paper, or other documentation must contain a declaration of any oxygenate or combination of oxygenates present in concentrations greater than 1 percent by volume.

*d. California Department of Measurement Standards*

The California Department of Measurement Standards (DMS) until this year administered a program requiring the labeling of gasoline pumps in California that dispensed gasoline containing alcohol (ethanol and methanol). These labeling requirements were contained in Business and Professions Code section 13480. This statute required that when a motor vehicle fuel contained at least 1 volume percent ethanol, methanol, or a combination of the two, the pump must be labeled “Contains alcohol”, followed by the type of alcohol in parentheses (either “ethanol”, “methanol”, or “alcohol and methanol”). The only requirement for the appearance of the label was that the letters must be at least one-half inch high. The labeling requirements of this statute were repealed by Assembly Bill 1650 in 1998, effective January 1, 1999.

2. Gasoline Octane Number

Currently, gasoline octane labeling requirements for gasoline pumps in the country are specified by the United States Federal Trade Commission (U.S. FTC). In California, the DMS also requires that the gasoline octane rating be labeled on the pump, but the appearance of the label is superseded by U.S. FTC’s gasoline octane labeling regulations.

The U.S. FTC’s gasoline octane labeling requirements, contained in 16 CFR section 306 require each gasoline pump be labeled with the fuel octane rating. This label must be 3 inches wide by 2½ inches long. The regulation specifies all the label’s type fonts and

sizes, and specifies that the basic color of the label must be process yellow, with all type and borders process black. All label colors must be non-fade, and the label must be capable of withstanding extremes of weather conditions for at least one year and be resistant to automotive fuel, oil, grease, solvents, detergents and water.



**TABLE 2**  
**LABELING REQUIREMENTS OF VARIOUS GASOLINE PROGRAMS**

<b>Labeling</b>	<b>Citation</b>	<b>Applicability</b>	<b>Required</b>	<b>Label</b>	<b>Location on</b>	<b>Typeset</b>	<b>Color</b>
EPA Wintertime Oxygenate	14 CFR §80.35	All Oxygenates	“The gasoline dispensed from this pump is oxygenated...”	Not Specified	<ul style="list-style-type: none"> <li>• Pump vertical surface</li> <li>• Clearly readable</li> <li>• Upper <math>\frac{2}{3}</math> of dispenser</li> </ul>	Block letters, black, 20-point pitch	Type contrasts with
WI Dept. Of Commerce Oxygenate	WI Adm. Code, Chap Comm 48, Subchapter III, section Comm 48.10	MTBE ETBE EtOH TAME	“Contains [Oxygenate Type]”	Not Specified	<ul style="list-style-type: none"> <li>• Conspicuous location</li> <li>• Clearly readable 6' from dispenser</li> <li>• Upper <math>\frac{1}{2}</math> of dispenser</li> </ul>	Minimum $\frac{1}{2}$ " high, $\frac{1}{8}$ " width	Label contrasts with dispenser
DMS Alcohol	B&P Code 13480(d) (Repealed 1/99)	EtOH MeOH	“Contains alcohol ([Alcohol Type])”	Not Specified	<ul style="list-style-type: none"> <li>• Conspicuous location</li> </ul>	Minimum $\frac{1}{2}$ " high	No requirement
FTC Octane Rating	16 CFR 306.10	Octane	“Minimum Octane Rating...”	3" X $2\frac{1}{2}$ "	<ul style="list-style-type: none"> <li>• Conspicuous location</li> </ul>	Helvetica Black type, font size specified, location on label specified	Label colors specified
National Conference of Weights & Measures	Handbook 130, Section 2.20, Paragraphs 2.20.2 & 2.20.2	All Oxygenates	“Contains [Oxygenate Type]”	Not Specified	<ul style="list-style-type: none"> <li>• Conspicuous location from drivers position</li> <li>• Upper <math>\frac{1}{2}</math> of dispenser</li> </ul>	Minimum $\frac{1}{2}$ " high, $\frac{1}{16}$ " width	No requirement

## **IV.**

### **PROPOSED AMENDMENTS**

This chapter describes the proposed amendments and the rationale for the early rescission of wintertime oxygen requirement in the Lake Tahoe Air Basin and the requirement for labeling of retail gasoline pumps dispensing gasoline containing MTBE. The discussion in this chapter is intended to satisfy the requirements of Government Code, section 11343.2, which requires that a non-controlling “plain English” summary of the regulation is made available to the public.

#### **A. Rescission of the Winter Oxygen Requirement in the Lake Tahoe Air Basin**

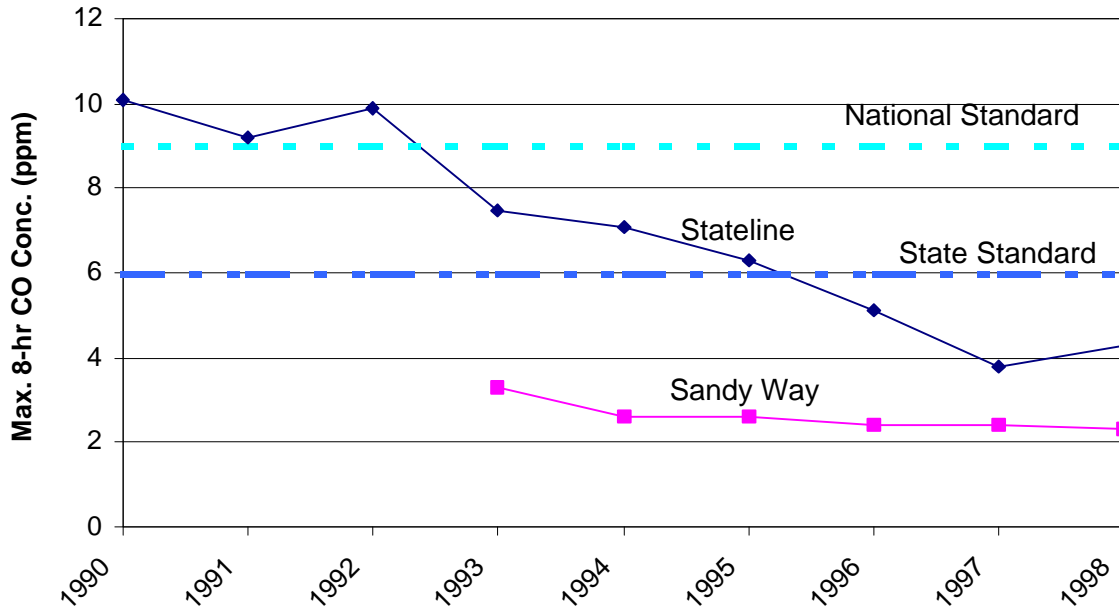
At the August 1998 Board Hearing, the Board considered a staff proposal that the requirement for a minimum of 1.8 weight percent oxygen for winter gasoline be rescinded in areas where the requirement is no longer needed to achieve and maintain the National Ambient Air Quality Standards for CO. The attainment areas comprise all of California except for Imperial County and the South Coast Air Basin.

In 1998, the ARB staff proposed that, except for the Fresno MSA and the Lake Tahoe Air Basin, the rescission take place as soon as possible. For the Fresno and Lake Tahoe areas, it was proposed that there be a two-year delay in the rescission. The delay was proposed because the winter oxygenate program would be useful in maintaining the national and State standards for CO in the Fresno and Lake Tahoe areas in the next two years. By the end of this time, the additional benefits from the vehicle fleet turnover will exceed the benefits from the winter oxygenate program.

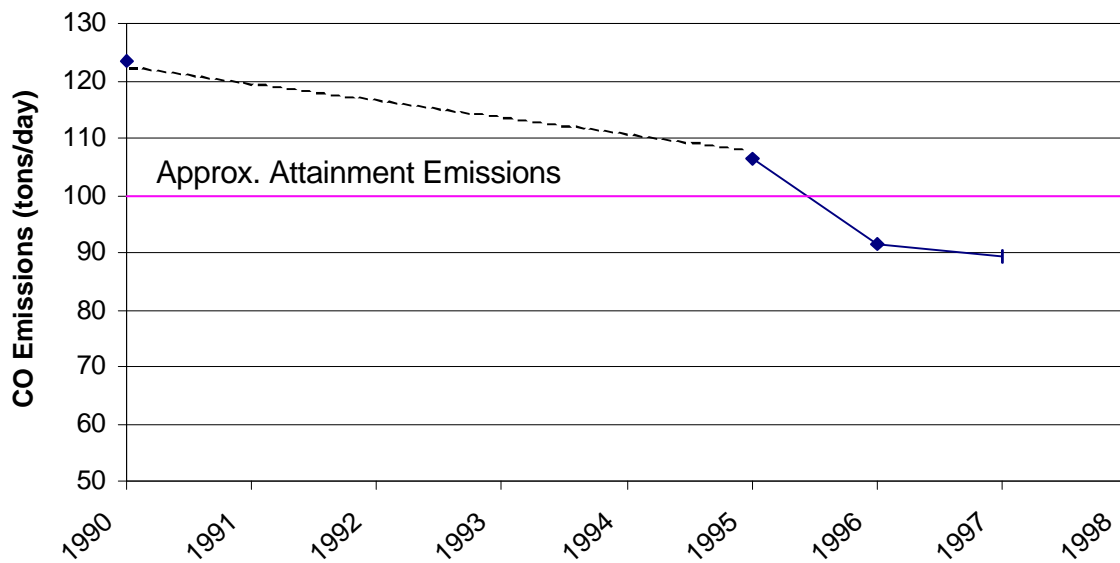
The ARB staff now proposes that the Board rescind the wintertime oxygen requirement in the Lake Tahoe Air Basin prior to the 1999-2000 winter period. This rescission would implement Governor Davis’s Executive Order D-5-99, Item 5, which directs the ARB to evaluate the need for the wintertime oxygenate program in the Lake Tahoe Air Basin. Figures 3 and 4 show that, based on monitoring data, the two sites in the Lake Tahoe Air Basin now attain both the State and national air quality standards for CO by a comfortable margin of safety, and that emissions of CO even with the rescission will not result in a violation of ambient CO standards.

The proposed amendment would allow the Lake Tahoe area to receive oxygen free fuel year-round. This amendment would benefit the area’s groundwater and drinking water supplies, as well as provide added protection to Lake Tahoe from hazardous pollutant contamination, while not causing increases in ambient CO concentrations that would be expected to cause a violation of State or national standards.

**Figure 3**  
**CO Air Quality Trends for Lake Tahoe**  
**1990 to 1998**



**Figure 4**  
**CO Emission Trend in Lake Tahoe**  
**1990 to 1997**



## **B. Labeling Requirement for Retail Pumps Dispensing Gasoline Containing MTBE**

ARB staff proposes amendments to the reformulated gasoline regulations to add labeling requirements for retail gasoline pumps dispensing gasoline containing MTBE (new section 2273, title 13, CCR). The proposed labeling requirements are in response to the Governor's Executive Order D-5-99, Item 7, which directs the ARB to develop gasoline pump labeling regulations to allow consumers to make an informed choice on the type of gasoline they purchase. In determining the appropriate labeling requirements, the gasoline labeling requirements and standards discussed in Chapter III were considered, as were the current delivery practices of gasoline suppliers (refiners, petroleum pipeline operators and retail distributors) in California.

### **1. Label Description**

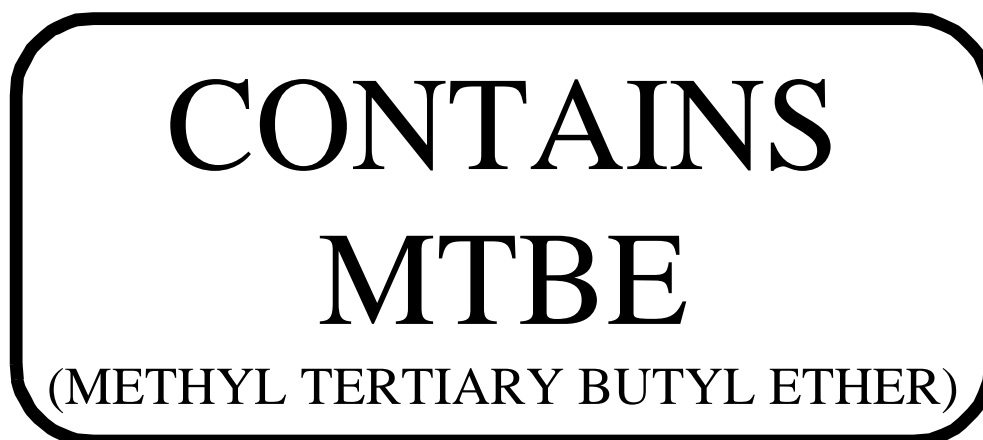
The proposed amendments would require the posting of a label containing the words "Contains MTBE (METHYL TERTIARY BUTYL ETHER)" for pumps that dispense gasoline containing MTBE. The label would be required to be placed on the upper two-thirds of the gasoline pump's vertical surface, on each side with volumetric and price meters. In order for consumers to readily determine if a gasoline pump dispenses gasoline with MTBE, the label must be conspicuous and legible to a customer when viewed from the driver's seat of an automobile.

Consideration is also being given to requiring on the label the statement, "The State of California has determined that the use of this chemical presents a significant risk to the environment." This would reflect the findings in the Governor's Executive Order.

The proposed amendments would also specify the appearance and durability of the label. To be clearly visible, the label must be contrasting in color to the gasoline pump, and the words "Contains MTBE" must have lettering not less than one-half inch high with a stroke of not less than one-eighth inch wide. The words "(METHYL TERTIARY BUTYL ETHER)" must have lettering not less than 3/16 inch high. An example of the label is shown in Figure 5. In order to ensure that the label is capable of withstanding the harsh operating conditions of a retail service station, the label must be capable of withstanding extremes of weather conditions for at least one year and must be resistant to gasoline, oil, grease, solvents, detergents, and water. Labels that become damaged and are no longer legible must be replaced.

It is expected that these labels will be obtained from the same vendors that currently provide labels displaying gasoline octane rating. If the new proposed labels are not locally available, they should be available from vendors serving gasoline retailers in Wisconsin since identical labels are already required in that area.

**Figure 5**  
**Sample MTBE Gasoline Pump Label**



2. Determination by retail gasoline operators of gasoline containing MTBE

Because of the extensive use of MTBE in California's gasoline pool, it is difficult to supply gasoline that contains no detectable amounts of MTBE. Currently, the California petroleum pipeline specification for non-oxygenated gasoline is less than 0.05 weight percent oxygen. This industry specification for non-oxygenated gasoline recognizes that gasoline transported through California's distribution system can be contaminated with oxygenates from prior gasoline deliveries. This mainly occurs from small amounts of oxygenated gasoline residuals being commingled during production and storage, transport in the pipeline system, and in terminal storage tanks. Further commingling can occur in gasoline storage tanks of retail service stations. The pipeline specification for non-oxygenated gasoline takes into account the contribution of all oxygenates that may be contained in the gasoline (such as gasoline may contain traces of MTBE, ETBE, TAME, etc.). This oxygen specification corresponds to a maximum MTBE content of 0.3 volume percent.

For the reasons discussed, it is impractical to supply gasoline with no detectable amounts of MTBE. Therefore, it is appropriate to establish a *deminimus* level that would identify gasoline not intended to be blended with MTBE. The proposed amendments specify that the *deminimus* level of MTBE in gasoline would be 0.3 volume percent

The proposed amendments would provide three means that can be used to determine whether gasoline in a storage tank at a retail service station contains less than 0.3 volume percent MTBE. One method involves sampling and testing in accordance with an established American Society for Testing and Materials (ASTM) test method. This method would be used by

enforcement personnel to determine compliance, and could be used by service station operators. The other two methods involve calculations based on the way in which the storage tank is refilled with gasoline containing less than 0.3 volume percent MTBE. These are designed as a less costly alternative that would allow a service station operator to assure himself that a MTBE label is not required, without having to conduct sampling and testing. If a service station operator provides records showing that the specified draining and refilling occurred, then the MTBE content will be presumed to be less than 0.3 volume percent even if a test by enforcement personnel shows an MTBE content of 0.3 volume percent or more. However, the presumption would not apply if a test by enforcement personnel shows an MTBE content of 3.0 volume percent or more, since in that case there would be a concern of possible falsification of records. Retail service station operators who chose to label their pumps by default do not have to maintain draining and refilling records for the proposed regulations.

The following describes the three methods to determine the MTBE content in retail gasoline storage tanks.

- a. Retailer service station operators may use American Society for Testing and Materials (ASTM) Method D 4815-94a, "Standard Test Method for Determination of MTBE, ETBE, TAME, DIPE, *tertiary*-Amyl Alcohol and C<sub>1</sub> to C<sub>4</sub> Alcohols and MTBE in Gasoline by Gas Chromatography."
- b. Retail gasoline service station operators may also use Table 3 to determine the number of consecutive times they must refill a storage tank with gasoline containing less than 0.3 volume percent MTBE in order to achieve an MTBE level of less than 0.3 volume percent in the tank. The number of tank refills is based on how far the operator drain down the tank each time. This table presumes that the service station operator is starting with a 95 percent full storage tank of gasoline containing 15 volume percent MTBE (2.7 weight percent oxygen), and that the tank will be drained and refilled by the same volume each time. The table applies to the last load of gasoline containing MTBE that is delivered to the storage tank.

**Table 3**  
**Determination of Tank Turnover Versus Amount of Tank Drain Down**  
**to Achieve 0.3 Volume Percent MTBE in Gasoline Storage Tanks**

Percentage of Gasoline Storage Tank Emptied Prior to Refilling	Consecutive # of Times Tank Must be Refilled	Resultant Volume % MTBE in Gasoline Storage Tank
90%	<b>2</b>	0.04
80%	<b>3</b>	0.06
70%	<b>3</b>	0.27
60%	<b>4</b>	0.28
50%	<b>6</b>	0.17
40%	<b>8</b>	0.19
30%	<b>11</b>	0.23
20%	<b>17</b>	0.27
10%	<b>36</b>	0.27

- c. Retail gasoline service station operators also have the option of using Equation 1 to determine the number of consecutive times they must refill their tanks to at least 95 percent of capacity with gasoline containing less than 0.3 volume percent MTBE in order to achieve an MTBE level of less than 0.3 volume percent in the tank. Unlike Table 3, Equation 1 allows for the determination of the number of tank refills for any given initial MTBE concentration (for instance, an initial tank MTBE concentration of 5.5 volume percent). Equation 1 is derived from the equation:  $C = C_o(V_L/V_T)^N$ , where  $C$  is the final concentration of MTBE in a tank,  $C_o$  is the initial MTBE concentration,  $V_L$  is the volume of gasoline (in gallons) left in the tank after each draw down,  $V_T$  is the capacity of the tank (in gallons), and  $N$  is the number of times the tank is drained and refilled. This equation can be rearranged to solve for the number of times the tank must be drained and refilled ( $N$ ), knowing that the final concentration of MTBE in the gasoline storage tank must be less than 0.3 volume percent (0.3 has been substituted for  $C$  in the above equation).

$$N = -(0.523 + \log C_o) / \log (V_L / V_T) \quad (\text{Equation 1})$$

Where:

- $N$  = The number of times the gasoline storage tank must be refilled.
- $C_o$  = The concentration, in volume percent, of MTBE in the gasoline (e.g., 11 volume percent).
- $V_L$  = The volume of gasoline in gallons left in the gasoline storage tank after each draining.
- $V_T$  = The capacity in gallons of the gasoline storage tank.

When using this equation, if the resultant number of tank refills is not an integer, it shall be rounded up to the next integer. For instance, a result of 7.15 tank refills would be rounded to 8 tank refills.

### 3. Documentation of MTBE Content by Gasoline Suppliers

To assist retail service station operators in properly labeling their gasoline pumps, the proposed amendments would require any supplier of gasoline to retail stations to provide, at the time of delivery of the fuel, on an invoice, bill of lading, shipping paper, or other documentation, a declaration of the presence and amount of MTBE in the gasoline. This documentation is only required for the purposes of labeling gasoline pumps. The proposed amendments would designate ASTM method 4815-94a as the method for determining the MTBE volume percentage for the purpose of compliance with the requirements.



## V.

### ECONOMIC AND ENVIRONMENTAL EFFECTS

This first part of this chapter summarizes the environmental and economic impacts associated with the proposed amendment rescinding the wintertime oxygen requirement in the Lake Tahoe Air Basin. The latter part summarizes the environmental and economic impacts associated with the proposed amendment regarding the labeling of retail gasoline pumps dispensing gasoline containing MTBE.

#### A. Rescission of the Wintertime Oxygen Requirement in the Lake Tahoe Air Basin

##### 1. Environmental Impacts

As stated previously, removal of the requirement that oxygenates be added to the wintertime fuels in the Lake Tahoe Air Basin will result in a slight increase in CO concentrations. However, the impact is very minor, being about 0.5 ppm if none of the gasoline is oxygenated. This is not expected to result in any violations of either the national or state standards, and the area is expected to remain as an attainment area for CO.

A positive benefit will be a reduction of potential hazardous impacts to the drinking water in the groundwater supplies and in the Lake Tahoe itself to the extent the amendment results in reduced usage of MTBE in the winter of 1999-2000. MTBE is highly soluble in water and will transfer readily to groundwater from gasoline leaking from underground storage tanks, pipelines, and other components of the gasoline distribution system.

##### 2. Cost Impacts

It is expected that adoption of the proposed amendments would not place any extra burden on the economy of the State, including motor vehicle fuel efficiency. Non-MTBE fuels will not place extra cost burdens on retailers or consumers, and the environment will not be degraded. The proposed action is not expected to result in costs to the gasoline producers because this proposed regulation does not prohibit the gasoline producers from adding MTBE.

##### 3. Small Business Impacts

The Government Code requires the ARB to discuss how complying with a proposed regulation could adversely affect small business. It is expected that the adoption of the proposed amendment will not result in any significant adverse impacts on small business.

#### 4. Global Warming and Ozone Depletion

The proposed regulation will have no impact on stratospheric ozone depletion. The regulation will result in a slight increase in CO concentration (up to approximately 0.5 ppm). CO blocks outgoing long-wave radiation, which can result in possible global warming. However, since CO levels are already well below national and below state standards and the increase is in the noise of the monitor, this regulatory action should not affect global warming.

### **B. Labeling Requirement for Retail Pumps Dispensing Gasoline Containing MTBE**

#### 1. Environmental Impacts

The proposed amendments are not expected to result in any adverse environmental impacts.

#### 2. Cost Impacts

It is expected that compliance with the proposed labeling requirements will result in minimal cost impacts to gasoline retailers and gasoline suppliers. Retailers selling gasoline containing MTBE will have to purchase labels to identify their gasoline as containing MTBE. It is expected that these labels will cost between \$1.00 and \$2.00 per label, and total costs per station should be less than \$25 annually. No new record keeping or reporting requirements on retailers are proposed. The total statewide cost of the proposed labeling requirements is estimated to be \$720,000 over the effective life of the regulation.

The costs associated with determining the content of MTBE in gasoline should be minimal. Retail service station operators have three options to determine the MTBE content of the gasoline in their storage tanks. Both the use of Equation 1 (page 17) and Table 3 (page 18) only require information regarding the operators' gasoline deliveries and the number of tank refills. The costs expected from this record keeping are minimal as retail service station operators already retain information on their gasoline deliveries. If retail service station operators choose to have the gasoline in their storage tanks analyzed for MTBE content, it is estimated that costs associated with this test to be approximately \$125. It is not expected that retail gasoline service station operators will use this method.

The proposed provisions requiring gasoline suppliers to provide a declaration of the presence and amount of MTBE in the gasoline they deliver should not lead to any significant increase in operating costs. It is expected that records are already kept at refineries and terminals documenting oxygen content of the gasoline produced or received. Some suppliers may decide to make some minor changes to increase the accuracy of their MTBE records, but overall it is expected that documentation costs to gasoline suppliers should be minimal.

3. Small Business Impacts

It is expected that adoption of the proposed amendment would not result in any significant adverse impacts on small businesses. Costs to small business would be similar to the estimated costs for gasoline retailers as discussed above in Section B - 2.

4. Global Warming and Ozone Depletion Impacts

The proposed amendments are not expected to increase emissions of greenhouse gases that may contribute to global warming or pollutants that may contribute to stratospheric ozone depletion.

## REFERENCES

1. "Proposed Amendments to the California Cleaner-Burning Gasoline Regulations," Air Resources Board, July 1998.
2. Impact of California Reformulated Gasoline on Motor Vehicle Emissions: 1. Mass Emission Rates (draft)," Kirchstetter, et. al., University of California, Berkeley, February, 1998.
3. "Health and Environmental Assessment of MTBE", Report to the Governor and the Legislature of the State of California as Sponsored by SB 521, Keller, et. al., November 1998.
4. California Air Resources Board, "MTBE (methyl tertiary butyl ether) Briefing Paper prepared by the California Environmental Protection Agency," Sacramento, CA, April 24, 1997 (Updated September 3, 1998).
5. California Air Resources Board, "An Overview of the Use of Oxygenates in Gasoline", Sacramento, CA, September 1998.

**Appendix A**

**Proposed Amendments to the**

**California Reformulated Gasoline Regulations**

# Proposed Regulation Order

## Amendments to the California Reformulated Gasoline Regulations

**Note:** The preexisting regulation text is set forth below in normal type. The proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to show deletions. The characters “\* \* \*

Amend title 13, California Code of Regulations, section 2262.5(a) to read as follows:

### Section 2262.5. Standards for Oxygen Content.

#### (a) *Minimum wintertime oxygen content standard for specified areas.*

- (1) Within the areas and periods set forth in section (a)(2), no person shall sell, offer for sale, supply, offer for supply, or transport California gasoline unless it has an oxygen content of not less than 1.8 percent by weight.

- (2)(A) *October 1 through February 29 (of any year):*  
South Coast Area

- (B) *October 1, 1998 through January 31, 1999 and October 1, 1999 through January 31, 2000:*  
~~Lake Tahoe Air Basin~~  
Fresno County  
Madera County

- © October 1, 1998 through January 31, 1999:  
Lake Tahoe Air Basin

- (D) November 1 through February 29 (of any year):  
Imperial County

\* \* \* \*

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).  
Reference: Sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43016, 43018, and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

Adopt title 13, California Code of Regulations, section 2273, to read as follows:

**Section 2273. Labeling of Equipment Dispensing Gasoline Containing MTBE.**

(a) All devices dispensing gasoline containing methyl tertiary butyl ether (MTBE) at filling stations, garages or other outlets where petroleum products are sold or offered for retail shall be marked with a conspicuous label at all times the product is offered for retail sale.

(1) The label shall state that the gasoline being dispensed "Contains MTBE (METHYL TERTIARY BUTYL ETHER)".

(2) The label shall be contrasting in color to the gasoline dispensing equipment and have lettering using not less than one-half inch high letters with a stroke of not less than one-eighth in width, except that "(METHYL TERTIARY BUTYL ETHER)" shall have lettering using not less than 3/16 inch high letters.

(3) The label shall be placed on the upper two-thirds of the gasoline dispensing equipment's vertical surface, on each side with gallonage and price meters.

(4) The label shall be conspicuous and legible to a customer when viewed from the driver's position.

(5) The label shall be capable of withstanding extremes of weather conditions for at least one year and shall be resistant to gasoline, oil, grease, solvents, detergents, and water. Damaged labels that are not legible shall be replaced.

(b) The labeling requirements in section 2273(a) do not apply to equipment dispensing gasoline from a storage tank containing gasoline having an MTBE content of less than 0.3 percent by volume. For the purposes of this section 2273(b), the MTBE content of gasoline in retail gasoline storage tanks may be determined through any of the following methods.

(1) It shall be presumed that the MTBE content in a retail gasoline storage tank is less than 0.3 percent by volume if the operator of the retail outlet demonstrates that the gasoline storage tank has been drained and refilled as specified in the following table, unless a test conducted in accordance with section 2273(b)(3) shows an MTBE content of 3.0 percent by volume or more.

<u>The percent of the gasoline storage tank that is emptied prior to refilling</u>	<u>The number of times the gasoline storage tank must be drained and refilled</u>
<u>90%</u>	<u>2</u>
<u>80%</u>	<u>3</u>
<u>70%</u>	<u>3</u>
<u>60%</u>	<u>4</u>
<u>50%</u>	<u>6</u>
<u>40%</u>	<u>8</u>
<u>30%</u>	<u>11</u>
<u>20%</u>	<u>17</u>
<u>10%</u>	<u>36</u>

- (2) It shall be presumed that the MTBE content in a retail gasoline storage tank is less than 0.3 percent by volume if the operator of the retail outlet demonstrates that the gasoline storage tank has been drained and refilled according to the following equation, unless a test conducted in accordance with section 2273(b)(3) shows an MTBE content of 3.0 percent by volume or more.

$$N = -(0.523 + \log C_o) / \log (V_L / V_T)$$

Where:

- N  $\equiv$  The number of times the gasoline storage tank must be drained and refilled. If the resultant number is not an integer, it shall be rounded up to the nearest integer.
- C<sub>o</sub>  $\equiv$  The initial concentration, in volume percent, of MTBE in the gasoline storage tank.
- V<sub>L</sub>  $\equiv$  The volume of gasoline (in gallons) left in the gasoline storage tank after each draining.
- V<sub>T</sub>  $\equiv$  The capacity (in gallons) of the gasoline storage tank.

- (3) The MTBE content in a retail gasoline storage tank may be determined by American Society of Testing and Materials (ASTM) Test Method D 4815-94a, which is incorporated herein by reference, or any other test method determined by the executive officer to give equivalent results.

- © The operator of the retail gasoline outlet shall be responsible for compliance with the labeling requirements in section 2273(a).



(d) Any person delivering gasoline containing 0.3 percent by volume or more MTBE to a retail gasoline outlet shall provide to the outlet operator or responsible employee, at time of delivery of the fuel, an invoice, bill of lading, shipping paper, or other documentation specifying the presence and approximate volumetric amount of MTBE in the gasoline. For purposes of determining compliance with this section 2273(d), the volumetric MTBE content of gasoline shall be determined by ASTM Test Method D 4815-94a, which is incorporated herein by reference, or any other test method determined by the executive officer to give equivalent results.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43018 and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal. Rptr. 249 (1975).  
Reference: Sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43016, 43018 and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal. Rptr. 249 (1975).

## **Appendix B**

### **Executive Order D-5-99**

**Appendix C**

**The Effects of California's Wintertime**

**Oxygenated Fuels Program on**

**Ambient Carbon Monoxide Concentrations**

## **Appendix D**

**University of California Report:**

**MTBE Fact Sheet**

**Appendix E**

**Background of Other State's**

**Labeling for Oxygenated Fuels**